

Simple and rapid method of isolating humic acids from tropical peat soils (saprists)

Abstract

Problem Statement: The isolation (extraction, fractionation and purification) of humic acids (HA) from soils is laborious, time consuming and expensive. The extraction, fractionation and purification periods of these substances vary from 12 h-7 days. In order to facilitate production of HA at competitive cost, this study was conducted to investigate whether a simple and rapid procedure could be developed for isolation of HA from well decomposed tropical peat soils (Saprists). **Approach:** A 0.1 M KOH was used to isolate HA of air dry peat soil at 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, and 24 h extraction periods after which samples (liquid obtained after centrifugation at 16,211 G for 15 min) were fractionated (using 6 M HCl) at 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, and 24 h. Samples were purified by washing them five times using distilled water instead of using HCl, HF, and an expensive process called dialysis that requires 1 to 7 days to purify HA. Each washing time was 10 min. Standard procedures were used to ascertain the purity (Ash, C, E4/E6, carboxylic, phenolic, total acidity, and K, Ca, Mg, and Na) and quantity of HA yield. Statistical Analysis System (SAS) was used for statistical analysis. **Results:** Although there was a linear relationship between extraction period and HA yield, there was no relationship between fractionation period and yield of HA. Distilled water used in this study was effective in purifying HA of the Saprists within 1 h without altering the true chemical nature of HA as it significantly reduced the mineral content of HA. Besides, C, E4/E6, carboxylic, phenolic, and total acidity of the isolated HA were typical of standard ones. **Conclusion:** The isolation of HA from peat soils can be reduced to 9 h (4 h extraction period, 4 h fractionation period and 1 h purification period) instead of the existing range of 1 to 7 days. © 2009 Science Publications.